

Appln. No.: 09/857,634
Amendment Dated November 22, 2005
Reply to Office Action of July 27, 2005

NSG-194US

Amendments to the Claims: This listing of claims will replace all prior versions, and listings, of claims in the application

Listing of Claims:

1. (Previously Presented) A light-receiving element array for receiving light beams demultiplexed for each wavelength from a wavelength multiplexed light beam and arranged in a straight line, wavelengths from the wavelength multiplexed light beam corresponding to respective channels, comprising:

a plurality of light-receiving elements for monitoring signals for each of the respective channels, and

a plurality of light-receiving elements for monitoring noises for each of the respective channels,

wherein the light-receiving elements for monitoring signals and the light-receiving elements for monitoring noises are alternately arrayed in a straight line, a direction thereof being the same as that of an arrangement of the demultiplexed light beams, and wherein the light-receiving elements for monitoring noises are positioned relative to the light-receiving elements for monitoring signals such that a signal shift of a monitored signal results in the monitored signal being received concurrently by one of the light-receiving elements for monitoring signals and by one of the light-receiving elements for monitoring noises.

2. (Previously Presented) The light-receiving element array according to claim 1, wherein the light-receiving elements for monitoring signals and the light-receiving elements for monitoring noise comprise pin-photodiodes, respectively.

3. (Previously Presented) A light demultiplexer, comprising:

a light-receiving element array according to claim 1 or 2 for receiving the light beams demultiplexed for each wavelength from the wavelength multiplexed light beam and arranged in the straight line,

wherein the signals and noises for each of the respective channels are separated to be monitored by the light-receiving element array.

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4. (Withdrawn) A light-receiving element array for receiving light beams demultiplexed every wavelength from a wavelength multiplexed light beam and arranged in a straight line, comprising:

a first row of light-receiving elements arrayed in a predetermined pitch and in the same direction as that of the arrangement of the demultiplexed light beams, and

a second row of light-receiving elements arrayed in the same pitch as the predetermined pitch and in the same direction as that of the arrangement of the demultiplexed light beams,

wherein the first and second rows of light-receiving elements are arrayed with one-half pitch shifted in an array direction.

5. (Withdrawn) The light-receiving element array according to claim 4, wherein the light-receiving elements are consisting of pin-photodiodes, respectively.

6. (Withdrawn) A light demultiplexer, comprising:

a light-receiving element array according to claim 4 or 5 for receiving light beams demultiplexed every wavelength from a wavelength multiplexed light beam and arranged in a straight line,

wherein the demultiplexed light beams are monitored by the light-receiving element array.

7. (Withdrawn) A method for aligning light-receiving element and demodulated light beams in a light demultiplexer including a light-receiving element array according to claim 4 or 5 for receiving light beams demultiplexed every wavelength from a wavelength multiplexed light beam and arranged in a straight line, the demultiplexed light beams being monitored by the light-receiving element array, said method comprising:

a step of aligning the light-receiving element and the demodulated light beams by using output signals from three light-receiving elements which are adjacent to each other in a direction perpendicular to the array direction of the first and second rows of light-receiving elements.

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8. (Withdrawn) A light-receiving element array for receiving light beams demultiplexed every wavelength from a wavelength multiplexed light beam and arranged in a straight line, comprising:

a plurality of light-receiving elements for monitoring signals, and

a plurality of electrode shorted light-receiving elements,

wherein the light-receiving elements for monitoring signals and the electrode shorted light-receiving elements are alternately arrayed in a straight line the direction thereof is the same as that of the arrangement of the demultiplexed light beams.

9. (Withdrawn) The light-receiving element array according to claim 8, wherein the light-receiving elements for monitoring signals and the electrode shorted light-receiving elements are consisting of pin-photodiodes, respectively.

10. (Withdrawn) The light-receiving element array according to claim 9, wherein the pin-photodiode comprising:

an n-type semiconductor layer, an i-type semiconductor layer and a n-type semiconductor layer stacked in this order on a n-type semiconductor substrate,

a p-type region which is formed by diffusing partially p-type material into the n-type semiconductor layer which is an uppermost layer,

a p-type electrode provided on the p-type region, and

a common n-type electrode provided on a bottom surface of the n-type semiconductor substrate.

11. (Withdrawn) The light-receiving element array according to claim 9, wherein the pin-photodiode comprises:

an n-type semiconductor layer, an i-type semiconductor layer and a p-type semiconductor layer stacked in this order on a n-type semiconductor substrate, the p-type and i-type semiconductor layers are isolated by an isolating trench from the adjacent p-type and i-type semiconductor layers,

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a p-type electrode provided on the p-type semiconductor layer, and

a common n-type electrode provide on a bottom surface of the n-type semiconductor substrate.

12. (Withdrawn) The light-receiving element array according to claim 10 or 11, wherein the p-type electrode of the electrode shorted light-receiving element is shorted to the common n-type electrode.

13. (Withdrawn) The light-receiving element array according to claim 10 or 11, wherein the p-type electrode of the electrode shorted light-receiving element is connected to one common metallic wiring which is shorted to the common n-type electrode.

14. (Withdrawn) The light-receiving element array according to claim 8 or 9, wherein the element area of the electrode shorted light-receiving element is smaller than that of the light-receiving element for monitoring a signal.

15. (Withdrawn) The light-receiving element array according to claim 8 or 9, wherein the light-receiving surface of the electrode shorted light-receiving element is provided with a light shielding film.

16. (Withdrawn) A light demultiplexer, comprising:

a light-receiving element array according to claim 8 or 9 for receiving light beams demultiplexed every wavelength from a wavelength multiplexed light beam and arranged in a straight line, and

wherein the demultiplexed light beams are monitored by the light-receiving element array.